

## Accepted Manuscript

Title: Over 675,000 lay people trained in cardiopulmonary resuscitation worldwide — The “World Restart a Heart (WRAH)” initiative 2018

Author: B.W. Böttiger

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: A. Lockey

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: R. Aickin

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: T. Bertaut

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: M. Castren

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: A. de Caen

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: E. Censullo

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: R. Escalante

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: L. Gent

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: M. Georgiou

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: K.B. Kern

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: A.M.S. Khan

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: S.H. Lim

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: V. Nadkarni

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: K. Nation

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: R.W. Neumar

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Author: J.P. Nolan

PII: S0300-9572(19)30050-4

DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>

Reference: RESUS 7921

To appear in: *Resuscitation*

Author: S.S.C.C. Rao

PII: S0300-9572(19)30050-4

DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>

Reference: RESUS 7921

To appear in: *Resuscitation*

Author: D. Stanton

PII: S0300-9572(19)30050-4

DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>

Reference: RESUS 7921

To appear in: *Resuscitation*

Author: C. Toporas

PII: S0300-9572(19)30050-4

DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>

Reference: RESUS 7921

To appear in: *Resuscitation*

Author: T.-L. Wang

PII: S0300-9572(19)30050-4

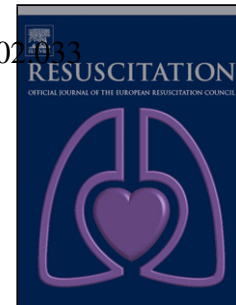
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>

Reference: RESUS 7921

To appear in: *Resuscitation*

Author: G. Wong

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921



To appear in: *Resuscitation*

Author: G.D. Perkins

PII: S0300-9572(19)30050-4  
DOI: <https://doi.org/10.1016/j.resuscitation.2019.02.033>  
Reference: RESUS 7921

To appear in: *Resuscitation*

Received date: 20 February 2019

Please cite this article as: Böttiger BW, Lockey A, Aickin R, Bertaut T, Castren M, de Caen A, Censullo E, Escalante R, Gent L, Georgiou M, Kern KB, Khan AMS, Lim SH, Nadkarni V, Nation K, Neumar RW, Nolan JP, Rao SSCC, Stanton D, Toporas C, Wang T-L, Wong G, Perkins GD, Over 675,000 lay people trained in cardiopulmonary resuscitation worldwide — The “World Restart a Heart (WRAH)” initiative 2018, *Resuscitation* (2019), <https://doi.org/10.1016/j.resuscitation.2019.02.033>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Over 675,000 lay people trained in cardiopulmonary resuscitation worldwide – The “World Restart a Heart (WRAH)” initiative 2018

Böttiger BW,<sup>1</sup> Lockey A,<sup>2</sup> Aickin R,<sup>3</sup> Bertaut T,<sup>4</sup> Castren M,<sup>5</sup> de Caen A,<sup>6</sup> Censullo E,<sup>7</sup> Escalante R,<sup>8</sup> Gent L,<sup>9</sup> Georgiou M,<sup>10</sup> Kern KB,<sup>11</sup> Khan AMS,<sup>12</sup> Lim SH,<sup>13</sup> Nadkarni V,<sup>14</sup> Nation K,<sup>15</sup> Neumar RW,<sup>16</sup> Nolan JP,<sup>17</sup> Rao SSCC,<sup>18</sup> Stanton D,<sup>19</sup> Toporas C,<sup>20</sup> Wang T-L,<sup>21</sup> Wong G,<sup>22</sup> Perkins GD<sup>23</sup>

<sup>1</sup>Department of Anaesthesiology and Intensive Care Medicine, University Hospital of Cologne, Cologne, Germany

<sup>2</sup>Emergency Department, Calderdale Royal Hospital, Halifax, United Kingdom

<sup>3</sup>Children's Emergency Department, Starship Children's Hospital, Auckland, New Zealand

<sup>4</sup>American Heart Association, Dallas, TX, USA

<sup>5</sup>Department of Emergency Medicine and Services, Helsinki University Hospital and Helsinki University, Helsinki, Finland

<sup>6</sup>Pediatric Critical Care Medicine, Stollery Children's Hospital, Edmonton, Canada

<sup>7</sup>Director of Science, ECC, American Heart Association, Dallas, TX, USA

<sup>8</sup>Unidad de Cuidados Intensivos, Instituto Nacional de Salud del Niño, Universidad Peruana de Ciencias Aplicadas - Centro de Simulación Clínica, Chair InterAmerican Heart Foundation/Emergency Cardiovascular Care, Lima, Peru

<sup>9</sup>American Heart Association, Dallas, TX, USA

<sup>10</sup>American Medical Center, Nicosia, Cyprus

<sup>11</sup>Department of Medicine, Division of Cardiology, University of Arizona, Tucson, Arizona, USA

<sup>12</sup>Chairman of the National CPR Committee, Saudi Heart Association (SHA), KSA, Clinical Associate Professor IM, Umm Alqura University, Saudi Arabia

<sup>13</sup>Department of Emergency Medicine and Education, Singapore General Hospital, Adjunct Associate Professor, Yong Loo Lin School of Medicine and Duke-NUS Medical School, National University of Singapore, Singapore

<sup>14</sup>Department of Anesthesia, Critical Care and Pediatrics, University of Pennsylvania Perelman School of Medicine, The Children's Hospital of Philadelphia, Philadelphia, PA, USA

<sup>15</sup>New Zealand Resuscitation Council, Wellington, New Zealand

<sup>16</sup>Department of Emergency Medicine, University of Michigan, Ann Arbor, Michigan, USA

<sup>17</sup>Department of Anaesthesia and Intensive Care Medicine, Royal United Hospital, Bath, United Kingdom

<sup>18</sup>Former President, Indian Society of Anaesthesiology (ISA), Founder Family Benevolent Fund, Managing Director of the Care Emergency Hospital, Kakinada, India

<sup>19</sup>Chair, Resuscitation Council of Southern Africa, Clinical Leadership, Netcare 911

<sup>20</sup>Heart and Stroke Foundation of Canada, Toronto, Canada

<sup>21</sup>Chairman, Resuscitation Council of Asia, CEO, National Resuscitation Council of Taiwan, Chang Bing Show Chwang Memorial Hospital, Taiwan, Medical and Law School, Fu-Jen Catholic University, Taiwan

<sup>22</sup>Heart and Stroke Foundation of Canada, Vancouver, Canada

<sup>23</sup>Warwick Clinical Trials Unit and University Hospitals Birmingham NHS Foundation Trust, University of Warwick, Coventry, United Kingdom

20 February 2019

### Correspondence

Bernd W. Böttiger, M.D., M.L., D.E.A.A., F.E.S.C., F.E.R.C.  
Director Science and Research, European Resuscitation Council (ERC)  
Chairman, German Resuscitation Council (GRC)  
Professor and Head of the Department of Anesthesiology and Intensive Care  
Medicine  
University Hospital of Cologne  
Kerpener Straße 62  
D-50937 Köln  
Germany  
E-mail: [bernd.boettiger@uk-koeln.de](mailto:bernd.boettiger@uk-koeln.de)  
Tel.: +49 221 478-82054 and 478-82052  
Fax: +49 221 478-87811  
<http://anaesthesie.uk-koeln.de>

Key words: cardiac arrest, cardiopulmonary resuscitation, International Liaison Committee on Resuscitation, "World Restart a Heart", lay resuscitation

“All citizens of the world can save a life”. With these words, the International Liaison Committee on Resuscitation (ILCOR) launched the first global “World Restart a Heart (WRAH)” initiative in 2018 – to increase public awareness and improve the rates of bystander cardiopulmonary resuscitation (CPR) for victims of cardiac arrest.

Following a lobbying campaign by the European Resuscitation Council (ERC), the European Parliament passed a Written Declaration in June 2012 with a majority vote of 396 signatures calling for the establishment of European Cardiac Arrest Awareness Week. The ERC initially established the first European Restart a Heart day on 16<sup>th</sup> October 2013 – and since then every year on the same date. For 2018, ILCOR expanded the concept to its global network of resuscitation councils and renamed it ‘World Restart a Heart’.

The following overarching principles were agreed [1]:

- 1) WRAH Day will occur every year on 16 October
- 2) ILCOR will share resources and enthuse and motivate regional resuscitation councils to participate.
- 3) Activity does not need to happen on 16 October, although that date will be used for media activity
- 4) Activity will not be limited to teaching school children, although some countries may wish to prioritise this
- 5) A dedicated website ([www.ilcor.org/wrah](http://www.ilcor.org/wrah)) and media strategy will be developed

Swift bystander CPR can increase survival and favorable neurological outcome up to threefold in cardiac arrest victims [2]. If all countries had lay bystander resuscitation rates of at least 50%, hundreds of thousands of lives would be saved every year worldwide. All seven ILCOR councils actively participated in WRAH 2018, and they were joined by Councils representing India and also the Arabic Resuscitation Councils.

To enable evaluation of the overall worldwide impact and measures of success, ILCOR asked all member councils and many National Resuscitation Councils (NRCs) to provide information about WRAH activities and estimate the numbers trained in CPR – with chest compression-only CPR training being the minimum requirement. Analysis of media metrics (e.g. reach of social media) enabled us to estimate the extent to which the message of WRAH had been disseminated as well as the number of lay people trained. The 2018 WRAH activity from around the globe is reported in Table 1.

Overall, social media impact and awareness with #WorldRestartaHeart reached over 12.7 million people in October 2018, and over 675,000 people were trained in CPR worldwide.

We hope that our unified global WRAH message “CHECK – CALL – COMPRESS” will further enable our policy makers around the world to take action in this most



important health care initiative. WRAH 2019 will be the next great opportunity for all citizens of the world to join together and show their respect and support for the promotion and facilitation of CPR education for everyone – “All that is needed is two hands.”

### **WRAH Web Links**

Further already existing information, videos, presentations, curricula and concepts on lay resuscitation initiatives, school children education in resuscitation and WRAH can be found here:

[www.erc.edu](http://www.erc.edu)  
[www.ilcor.org/wrah](http://www.ilcor.org/wrah)  
[www.lifesaver.org.uk](http://www.lifesaver.org.uk)  
<https://kids-save-lives.net/>  
[www.grc-org.de](http://www.grc-org.de)  
<https://www.ircouncil.it/>  
<https://www.resus.org.uk>  
[www.einlebenretten.de](http://www.einlebenretten.de)  
[www.wiederbelebung.de](http://www.wiederbelebung.de)  
<http://www.wosp.org.pl/uczymy-ratowac/rekord>  
<https://www.youtube.com/watch?v=0Yf4umHnD3c>  
<https://www.youtube.com/watch?v=UYlvdUcGjz0>  
<https://www.youtube.com/watch?v=EDp4krk2--M>  
<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P7-TA-2012-0266+0+DOC+XML+V0//EN>  
[www.heart.org/handsonlycpr](http://www.heart.org/handsonlycpr)  
<https://youtu.be/sG XK9O5801Y>  
<https://www.nzrc.org.nz>  
<https://resus.org.au>

## Conflicts of Interests

Bernd W. Böttiger is European Resuscitation Council (ERC) Board Director Science and Research; Associated Editor, European Journal of Anaesthesiology (EJA); Speakers honorarium from Medupdate, FoMF, Baxalta, Bayer Vital, Bard; Chairman, German Resuscitation Council (GRC); Board Member, German Society of Interdisciplinary Intensive Care and Emergency Medicine (DIVI); Associated Editor, Resuscitation. Maaret Castren is the Honorary Secretary of ILCOR. Lana Gent is employed by the American Heart Association. Andrew Lockey is Honorary Secretary of the Resuscitation Council (UK). Kevin Nation is employed as Chief Executive by the New Zealand Resuscitation Council. Robert W. Neumar is ILCOR Co-Chair and has received NIH research funding (R34 HL130738, R44 HL091606, K12 HL133304, R01 HL133129) and industry research support from PhysioControl (equipment support for laboratory and clinical research). Jerry Nolan is Chair of the ERC and Editor-in Chief of Resuscitation. Gavin Perkins is Co-Chair ILCOR and ERC Board Director ILCOR and Guidelines. Richard Aickin, Allan de Caen, Raffo Escalante, Karl B. Kern, Swee Han Lim, Vinay Nadkarni, David Stanton and Tzong-Luen Wang declared that they have no conflicts. All other authors did not stated any conflicts.

## Acknowledgement

We cordially thank all colleagues, ministers, politicians, teachers, women and men, children, organizations, medical societies und business entities who have supported and will support the ILCOR „World restart a heart“ initiative and other initiatives all over the world. Bernd W. Böttiger and Gavin Perkins are supported by the ERC Research NET.

## References

1. Böttiger BW, Lockey A, Aickin R, Castren M, de Caen A, Escalante R, Kern KB, Lim SH, Nadkarni V, Neumar RW, Nolan JP, Stanton D, Wang TL, Perkins GD. "All citizens of the world can save a life" - The World Restart a Heart (WRAH) initiative starts in 2018. Resuscitation. 2018 Jul;128:188-190. doi: 10.1016/j.resuscitation.2018.04.015. Epub 2018 Apr 19.
2. Wissenberg M, Lippert FK, Folke F, et al. Association of national initiatives to improve cardiac arrest management with rates of bystander intervention and patient survival after out-of-hospital cardiac arrest. JAMA 2013;**310**:1377–84.

<b>Council</b>	<b>Activity</b>
American Heart Association	The American Heart Association conducted a Hands Only CPR mobile tour throughout August and September ahead of WRAH Day, traveling to 5 states over 6 weeks with 18 stops. They trained 4,801 people and all received a WRAH flyer. A further 10,908 people were trained later in 2018, and therefore, 15,709 people were trained in total.
Arabic Resuscitation Councils	Hands only CPR training was performed for the public at shopping malls, for school students, and for University students and staff. Overall, 6,000 people were trained in Saudi Arabia, 400 in Oman, 600 in Jordan, and 500 in Egypt.
Australian and New Zealand Committee on Resuscitation	In Australia, 20,000 people were engaged in promotional activities with the personal support and a speech from Scott Morrison, the Australian Prime Minister. Events across the country were coordinated by the Council of Ambulance Authorities. In New Zealand, activities were organized by St. John and Wellington Free Ambulance Service. Sessions were held in schools, airports, and hospitals with an estimated 2,150 people involved. The social media campaign, supported by the New Zealand and Australian Resuscitation Councils, reached 16,600 via Facebook and 15,000 via Twitter.
European Resuscitation Council	The most impressive results for 2018 were reported from the United Kingdom, where CPR has become mandatory on the English school curriculum and 240,000 people were trained in CPR. In Poland, 116,342 were trained, in Germany 25,000, and in Italy 8,000. Overall, 410,000 people were trained in CPR in Europe during WRAH 2018. The European Society of Anaesthesiology (ESA) and the European Society of Emergency Medicine (EuSEM) have actively supported WRAH 2018.
Heart and Stroke Foundation of Canada	To compliment year-long training activities, the Heart & Stroke Foundation of Canada implemented a social media awareness campaign to specifically highlight WRAH. The campaign emphasized multiple messages relating to early response and survivor stories. Heart & Stroke distributed a campaign toolkit to stakeholders with tips, visuals and an invitation to engage online. The campaign generated high levels of engagement in Canada, including over 77,900 impressions across platforms. A how-to video on hands-only CPR video was viewed over 179,000 times in English and French.
Indian Resuscitation Council	The Indian Resuscitation Council, members of the Indian Society of Anaesthesiologists, and other professional societies performed nationwide CPR training of laypeople in high schools, colleges, bus stations, railway stations, police stations, company offices, and other public places. At least 30 federal states of India participated and many Chief Ministers and Health Ministers were actively involved. Overall, 200,000 people were trained in India for WRAH 2018.
InterAmerican Heart Foundation	The Inter American Heart Foundation reported activities in Peru and pledged improved engagement for WRAH 2019.

Resuscitation Council of Asia	In Japan, there were several promotions regarding CPR training, including the preparation of a CPR compulsory program for junior-high and high school students, with further consideration for the elementary school level. On WRAH Day, the “Many Nationalities in a CPR Training Session” program was implemented and 59 people from 36 embassies in Tokyo were invited to attend this event to raise public awareness about CPR. In South Korea, the Korean Association of CPR held its annual symposium attended by 400 researchers and educators. In Singapore, WRAH activities were supported by Senior Government Minister and 20,000 military personnel were trained in CPR. In Taiwan, mandatory CPR education in schools has been established for 18 years, and CPR rates have improved over that time from less than 4% to more than 40%. In Hong Kong, a joint WRAH awareness campaign was performed with Red Cross and St John Ambulance.
Resuscitation Council of Southern Africa	A CPR week was performed in November. Around 1,000 people were trained in CPR in disadvantaged areas where it takes a long time for emergency services to arrive. The Resuscitation Council of South Africa will align next year’s activities exactly to the WRAH date.

Table 1